

# G.A. Bullet in

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**GA Modernization... An Accurate Shot to the Future**

**In this issue:**

- > President Aquino Awards GA
- > An Accurate Shot to the Future of National Defense
- > Acquisition of Dedicated Lines for Small Arms Ammunition
- > Laser Marking of Ammunition
- > Small Arms Repair and Upgrade Unit

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## EDITORIAL

### GA – Taking a More Significant Role in National Defense

It is worth to reiterate the GA's functions mandated by laws such as the Administrative Code of 1987 and RA 1884 as this catapults GA into its right status as far as the country's defense industry is concerned.

Said laws place tasks to GA such as to formulate plans and programs to achieve self-sufficiency in small arms, mortars and other weapons and munitions; design, develop, manufacture, procure, stockpile and allocate small arms, mortars, and other weapons and munitions without the necessity of obtaining any permits or licenses; and devise ways and means for the efficient mobilization of the civilian industry to augment the production of the Arsenal in times of emergency.

With its significant programs, projects and activities being undertaken aggressively in the last couple of years, the GA is just actually living up to its mandated functions that had long been lying dormant, understandably due to lack of the needed boost and funding support in the past.

Aside from initial piece-meal acquisition of essential production equipment to fill-in bottleneck operations, the recent approval for the acquisition of complete dedicated manufacturing lines for the 5.56mm and 9mm ammunition would positively impact on the supportability of small arms ammunition (SAA) to our government law enforcement agencies, and eliminate the meticulous procurement process for SAA through bidding, which are usually supplied by foreign manufacturers.

The support being accorded to on the repair and refurbishing of a large inventory of AFP's used or unserviceable M16 Rifles, and upgrade into M4 inside GA's facilities, is another milestone in its accomplishments, generating savings for the government, and propelling the local defense self-reliance initiatives.

Likewise, this opens much room for near future Joint Venture or other defense-related investment projects that interested local or foreign proponents might deal with the GA, with the Presidential Proclamation No. 371 (May 06, 2003) amending the purpose of the GA land from "military" to "defense industrial"; and Executive Order 303 (March 29, 2004) which mandates the AFP/PNP and other law enforcement agencies to source their SAA and other munitions as may be available from the GA, thereby ensuring a ready market for GA's produce.

Further, Chapter 7 of the Implementing Guidelines, Rules and Regulations of the Revised AFP Modernization Act (DC No. 03 dated April 11, 2013) provides for the modernization of the GA to achieve a certain level of manufacturing capabilities where it could ably provide the basic weapons, ammunition and other munitions requirements of the AFP, and the other government law enforcement and security forces. Said Chapter of DC No. 03 likewise reiterates the provision for Joint Venture, co-production or similar arrangements that GA is authorized to enter into; and full utilization of GA in the conduct of defense material related R & D activities in consonance with the Self-Reliant Defense Posture Program of the Philippine government.

It can be surmised that all these laws and government policies provide a leeway for the GA to perform a more significant role pertaining to the country's national defense, and which it has been doing aggressively in the past couple of years.

## Director's Corner

I am always an advocate of in-country self-sufficiency when it comes to defense materials as I believe every nation must achieve a certain level of Defense Self-Reliance to protect its Sovereignty.

In managing a civilian manufacturing bureau under the Defense Department, it is every GA Director's dream and vision to achieve self-sufficiency in ammunition and weaponry for use of AFP, PNP and other government law enforcement agencies, and expand not only its capacity, but capability as well, in accordance with its mandated functions.

In terms of small arms ammunition (SAA) production, the GA is gradually fulfilling such vision of self-sufficiency, and in a couple of years ahead, eventually fulfill 100% supportability to the requirement in SAA of the AFP, PNP and other law enforcers, with the approval of the funding for the complete dedicated manufacturing line for 5.56mm and 9mm ammunition.

Planning and preparations are multi-faceted for the bigger role that GA will be embarking in the near future. Capitalizing on the merits of Presidential Proclamation No. 371 converting GA land into a Defense Industrial estate, the GA is into the preparation of a Topographic Survey, through an awarded contract, which is already nearing completion. This is prerequisite for the eventual preparation of the GA Master Development Plan (MDP), which was already awarded through public bidding of consultancy services. The MDP will be the point of reference for all future defense industrial investment projects to be put up inside the camp through Joint Venture or any co-production arrangements with local and/or foreign proponents. Part of the plan is application for a special economic zone to avail of tax holidays and other incentives, as encouragement to investors. The GA intends to enter into Joint Venture undertakings with local and / or foreign investors by 2015.

Meanwhile, GA will also be working on expansion of existing buildings and facilities to accommodate additional production equipment, and to house the new dedicated manufacturing lines; and expansion / augmentation of existing warehouses and magazines for raw materials and finished products.

Simultaneously, the GA has to further prepare its pool of management professionals and technical people for the higher and more complex roles that GA will be performing in the years ahead. There are plans in place for training of Managerial professionals and foreign technical training in various fields of ammunition manufacture, primer and propellant know-how, as well as in Quality Control. Local training are currently being availed to reinforce current capability on equipment maintenance, tools and dies fabrication and other skills enhancement programs.

Combining all these efforts and initiatives, we all keep our thrust on a modernized Arsenal, with the end goal of being a proactive arm of the defense department and the government to give the much needed boost in the country's Self-Reliant Defense Posture program.



# PRESIDENT AQUINO AWARDS GA

## FOR ITS INVALUABLE SUPPORT TO PSG

On the 28<sup>th</sup> Founding Anniversary of the Presidential Security Group (PSG) held at their headquarters in Malaca-



ñang Park on March 7, 2014, no less than His Excellency President Benigno "PNoy" Aquino awarded the Plaque of Appreciation to the Government Arsenal (GA) for its invaluable support extended to PSG in providing its firing range and ammunition during their Command Proficiency Firing training in 2013. Assistant Director Villamor Villa received the award in behalf of the GA.

(By: San Narciso)

## AN ACCURATE SHOT TO THE FUTURE OF NATIONAL DEFENSE:

### Establishing GA's Critical Function for the SRDP Program and the PDI

*"The whole secret of existence is to have no fear. Never fear what will become of you, depend on no one. Only the moment you reject all help are you freed." – Buddha*

#### A. GA-SRDP-PDI Bond – The Defense "Tri-Bond"

The Philippine Self-Reliant Defense Posture (SRDP) Program provides the Government Arsenal (GA) with an opportunity not only to modernize its capabilities to increase ammo production output but also to expand its capabilities in support to the revitalization of an indigenous defense industry – the Philippine Defense Industry (PDI). Coupled with the AFP Modernization Program, the SRDP Program can be viewed as the means to promote and sustain the PDI primarily through the GA. Undoubtedly, this purview of a triple-bond relationship between the GA, SRDP and the PDI is explicitly echoed in articles posted in the Philippine Defense Forum – "The Self-Reliant Defense Posture Program Witnessing a Rebirth" and "A Self-Reliant Defense Posture (SRDP) roadmap and a DARPA-equivalent," as well as mandates provided in PD415 (SRDP LAW), RA7898/10349 (AFP Modernization Act/Revised AFP Modernization Act), RA1884 (GA Act) and the Admin Code of 1987.

As gleaned in the "SRDP Roadmap" article in the Philippine Defense Forum, the author recognizes how other countries adopted "national policies that apply technological solutions to defense" and in effect developed "indigenous military industrial complexes." These innovations served as basis for the creation of respective entities that oversee strategic applications of research and development of military

and national defense technologies. Along this line, the author surprisingly noted certain key elements present in recent and current GA projects and programs that are deemed conducive to transforming the GA into such an entity. These projects and programs include GA being proclaimed as a defense industrial real estate (PP371) and the creation of its master development plan. Moreover, the author recognizes the GA's "central role on SRDP" in the near and mid-terms and in the long term but depending on the evaluation and subsequent evolution of the GA into an expanded or diversified government agency of the DND or perhaps even as a government controlled corporation under the DND.

Significantly, the GA is continuously exploring avenues to expand its capabilities beyond the ordnance and small arms development and manufacturing capabilities. These initiatives to diversify are exemplified in the recent studies made on the proposed rolling mill plant and the textile and military uniform manufacturing ventures. Additionally, the GA is extensively involved in inter-agency activities with the Department of Trade and Industry, Board of Investments, Banko Sentral ng Pilipinas and the Philippine National Police to determine other feasible development and diversification projects that would expand GA role as a defense industry hub. While the GA is deeply aware of the need to develop indigenous capabilities such as ammunition and small arms manufacture, it remains committed to complementing this essential capability together with a sound procurement system to fully achieve its development and expansion goals.

Interestingly, PD415, RA1884, and the Admin Code of 1987 all imply, if not directly require, defense partnership

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(Continued from page 3)

ventures that would eventually expand or diversify GA PDI capabilities in furtherance of the SRDP program. Along this line, it can be gleaned that no other bureau under the DND would be more suited and more capable to pursue SRDP goals but the GA in view of its mandated mission and functions. Considering that its mission and functions converge towards the enhancement of self-sufficiency in defense requirements or the ability to supply the country's defense needs without external assistance, partnership arrangements merely complement such capability and does not constitute full dependence on the partner.

Moreover, self-reliance or reliance on oneself or one's own powers, resources, etc., in upholding a defense posture and in promoting a local defense industry as implied in SRDP suggests that GA mission-functions and SRDP goals actually complement each other. Hence, they are indispensable in securing adequate defense requirements and in pursuing an indigenous defense industry. It would appear therefore that GA-SRDP objectives of self-sufficiency in defense requirements and self-reliance in defense materiel production capability, respectively, suggests that their direction and desired end-states augment each other and are both essential in promoting and sustaining a viable national defense posture for the Philippines.

To date, there are currently around twelve (12) foreign and local joint venture proposals offered to the GA from various defense corporations that have been forwarded for consideration by the DND. This only proves that defense industry opportunities are seen in the GA by these proponents. Clearly, the GA might eventually transcend into a profit manufacturing entity upon full implementation and operation of its dedicated ammo manufacturing lines. Hence its status as an operating agency of the DND might have to be reviewed. More importantly, the status of the GA as the country's defense industry hub would definitely be secure following the mandates of Presidential Proclamation 371 of 2003 which directs the development of the GA as a local industrial base as required in defense self-reliance.

## B. GA Projects – Vital Linkages to SRDP and PDI

Accompanying the list of joint venture proposals awaiting the GA is a series of modernization and enhancement projects particularly for increased ammunition production output; munitions systems; and small arms repair, upgrade and manufacture:

### 1. Past/Currently Implemented (Capable) Projects:

#### 1.1 Line Systems De-clogging – Increased production



through additional shifts and repair of old machines and equipment. From 2010 output of 15M rounds, production increased to 23.3M rounds in 2013, and 40M rounds is earmarked for 2014. It is also expected to increase by 110M rounds by 2016 upon complete acquisition of the dedicated manufacturing lines.

**1.2 Product Diversification – Development and production of 7.62x37mm Musang, Teflon-Coated Pistol rounds, Blanks, Match Grade Ammo, M855.**

**1.3 Research & Development – Intensive R & D initiatives resulted to implementation of projects such as use of plastic ammo box, vacuum-sealed packaging with Silica Gel inserts, speed loader, dissipator, etc.**

**1.4 Repair, Refurbishing and Upgrade of AFP Weapons –** Currently, 1,740 of the 3,299 units unserviceable Rifles, 5.56mm M16A1 of the AFP have been refurbished while the rest are up for the same procedure. There are also 32 units Pistol, Cal .45, M1911A1 that have been repaired and upgraded. This project also includes the manufacture of 50 units GA Personal Defense Weapon (PDW) for 7.62 x 37mm, Musang Cartridge, 15 units GA 5.56mm Special Purpose Rifle (SPR) and upgrade of 485 units 5.56mm, GA 16" Mid-Length Carbine.

**1.5 Universal Weapon Rest –** Installed in the GA's Ballistics Facility, it is the only one of its kind in the country and this is used to measure the accuracy of any small arms weapon.

**1.6 Hardcoat Anodizing/Cerakote –** For the improvement of weapons parts to increase corrosion and wear resistance

**1.7 Support to AFP Training Program –** AFP units are provided with free ammunition during their training / familiarization firing at the GA Firing Range Complex. About 68 various AFP units have benefited from this project since 2010.

## 2. Other Completed Projects (2010 – 2013)

### Process Improvement

- 2.1 Development of Liquid Detergent for use in In-process and Final Washing of Cases and Bullets
- 2.2 Development of Industrial Soap Flakes for use in Cases and Bullets Manufacture
- 2.3 Substitute Material for 5.56mm M855 Bullet Tip Painting
- 2.4 Replacement of Screen-Printed Marking for Hard Plastic Crate and Machine Printed Marking for Carton Box with Sticker Marking
- 2.5 Development of Heating System from Steam to Electric in the Case and Bullet Manufacturing

(Continued on page 5)



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### Operations

- 2.6 Improvement of In-process Specifications and Procedures for M27 Metallic Links
- 2.7 Restoration of Electric Conveyor for Annealing Operations
- 2.8 Alternative Disinfection for GA Water Treatment System
- 2.9 Improvement of Water Treatment System

### Product Development / Improvement

- 2.10 Codification of GA Ammo Products
- 2.11 Development of More Durable Ammo Carton Boxes
- 2.12 Revised Design of Wooden Wire Bound Crate for 5.56mm M855 Ammo
- 2.13 Development of Magazine Speed Loader for all 5.56mm ammo
- 2.14 Design of Progressive Die for M27 Links
- 2.15 Development of Ballistic Gelatin
- 2.16 Development of 7.62mm M80 using the Old Assembly Machine
- 2.17 Development of Standard Length 7.62mm Blank Ammo
- 2.18 Development of GA 5.56mm for M4 Carbine
- 2.19 Loading and Assembly and Testing of 5.56mm Match Ammo
- 2.20 Loading and Assembly and Testing of 7.62mm Match Ammo
- 2.21 Development of Blank Firing Adapter for M-14 Rifle
- 2.22 Development of Blank Firing Adapter for M60 Machine Gun
- 2.23 Conversion of Cal .45 Bumping to 5.56mm and Cal .45 De-priming Machine
- 2.24 Conversion of 5.56mm Bullet Assembly Machine for Production of 7.62 M80 Bullet
- 2.25 Modification of Rifle Cartridge Loading and Assembly Machine Parts
- 2.26 Feasibility Study on the Establishment of Brass Rolling Mill



Upon completion of delivery, this will increase production to at least 40M rounds

- 3.2 **Fabrication Equipment** – A total of four (4) new equipment were acquired for the GA's Machine Shop and SARUU to augment current capability in the fabrication of precise toolings and small arms weapons parts. One (1) unit Vacuum Furnace for the heat treatment of various steel raw materials is also awaiting delivery.

- 3.3 **Dedicated Production Lines for 5.56mm and 9mm ammunition** – Recently approved by the President, the complete production lines are up for procurement to further increase production by at least 110M rounds

per year. This project is expected to be fully implemented by 2016 and fill up the ammo requirements of the entire AFP, PNP and Philippine Law Enforcement. This will also be a source of funding for the AFP Modernization Trust Fund for the export of excess ammo from the local demand.

**3.4 Laser Marking & Packaging Machine** – This acquisition project for 5.56mm ammunition integrates the automated carton packing operation with a laser marking station and data matrix printing to help in the traceability of manufactured ammo.



### R & D Projects

- 3.5 Development of Plastic Box as Replacement to Metal Box for Linked Ammo
- 3.6 Development of Collapsible Plastic Crate as Replacement to Wooden Wire-bound Crate for Linked Ammo
- 3.7 Improvement of Hardness and Grain Size Testing Procedure
- 3.8 Study on In-house Production of Methyl Violet Test Paper Used in the Conduct of Stability/Heat Test of Propellant Powder
- 3.9 Establishment of Carton Box Manufacturing Line
- 3.10 Feasibility Study on the Establishment of Lead Wire Manufacturing Plant
- 3.11 Feasibility Study on the Establishment of Plastic Manufacturing Line; and Acquisition of Plastic Packaging Mould
- 3.12 Feasibility Study on the Establishment of Micro-Hydroelectric Power Plant

### 4. Upcoming/Proposed Projects:

- 4.1 **GA-SOF MOA Project** – This is a joint research and development MOA on small arms which is expected to introduce a direct line for small arms test and evaluation and research and development thru the use of GA equipment and facilities, info sharing among GA engineers and AFP SOF weapons experts, and consolidation of SOF small

### 3. Ongoing/Approved Projects for Implementation:

#### Acquisition Projects

- 3.1 **Production Machines** – Five (5) units are under procurement, two (2) units of which (for the Cartridge Plant) were already delivered, and the three (3) units for the Case & Bullet Plant are due for shipment.

(Continued on page 10)



# ACQUISITION OF DEDICATED LINES FOR SMALL ARMS AMMUNITION

## A Cost-Benefit Analysis and ROI Calculation Report

### A. Background:

The Project on the Acquisition of a Complete and Dedicated Manufacturing Line for 5.56mm and Cal .45 Small Arms Ammunition (SAA) is a CY 2013 GA Priority Project worth almost PhP1.9B and is congruent to Phase 1 (Enhancement of the Arsenal's Capability in Production of SAA) of the proposed House Bill 76 (An Act Providing for the Modernization of the Government Arsenal and Appropriating Funds Therefor) introduced by Congressman Albert Garcia of Bataan in the 15<sup>th</sup> Congress. Phase 1 of this act is aimed at providing the GA with dedicated ammo manufacturing lines for 5.56mm, 7.62mm, 9mm, and Cal .45 ammunition to ensure a steady, reliable, and significantly increased SAA production rate for the GA.

The GA Committee on Modernization for the Acquisition of Machines for Small Arms Ammunition (CMAMSAA) was created effective November 25, 2013, tasked primarily for the preparation of a report for the Secretary of National Defense and the President regarding a cost benefit analysis and return on investment calculation of the approved establishment of dedicated small arms ammo manufacturing lines.

The proposed report highlights the GA capability to provide the entire basic small arms ammunition requirements of the AFP, PNP, and Philippine Law Enforcement Agencies (LEAs) with the excess to be marketed to potential non-government local and foreign consumers following the said acquisition project. It is primarily purposed to provide reference in determining the rate of returns following the expended cost of investing in the project.

Assistance with the gathering of data and in calculating rates of returns were provided by Investments Specialists from the Manufacturing Industries Department, Industry Development Group, Board of Investments-Department of Trade and Industries during a consultative meeting last January 16, 2014 and a workshop last January 22, 2014. This workshop was conducted together with representatives from the Logistics, Comptrollership, and Engineering Divisions of the GA. Moreover, data regarding the costing of imported ammunition were provided by the Firearms and Explosives Division of the Philippine National Police.

### B. Topic Description:

The report introduces the project cost-benefit analysis and return on investment calculation to estimate and compare the benefits and costs in investing in a dedicated ammo manufacturing line capability, as well as the expected returns on per round of small arms ammo (5.56mm, 7.62mm, 9mm, and Cal .45) manufactured by GA upon employment of such capability. Per EO 303 dated March 2004, the AFP, PNP and Philippine LEAs are required to source their entire ammo requirements only from the GA and this can only be fully realized following the implementation and emplacement of the proposed GA dedicated line capability acquisition

*EO303 (March 29, 2004): mandates the AFP/PNP and other Law Enforcement Agencies to source their small arms ammunition (SAA) and other munitions as maybe available from the GA.*

project. This report therefore hopes to provide a clear and thorough basis for comparing the total expected cost of acquiring a dedicated line ammo manufacturing capability and the expected benefits and returns on such investment. This means that the cost of investment will be weighed against the foreseen benefits and the expected amount and time of inflow of revenue returns when excess of manufactured ammo are eventually marketed to external markets (local and foreign) or non-Philippine government entities.

The following assumptions and conditions have been considered to serve as a fundamental management standpoint from where attempts to predict future outcomes that may significantly affect the project can be made and subsequently test or prove correct the results ensuing from the report:

1. That no adverse incident of national scale requiring massive mobilization and utilization of military ordnance or any other national emergencies that would require consolidation and integration of ammunition manufacturing capability for national defense will be required for the next five (5) years.
2. That only two (2) work shifts per day are required and sustained for the next five years, although such can be extended to three (3) work shifts per day and work on weekends and holidays should the need arises.
3. That no major equipment and infrastructure breakdown is experienced in the GA over the next five (5) years.
4. That supply would be equal or even less than the demand such that excess production output not consumed by the AFP-PNP-LEAs will be completely consumed by external foreign and local markets.
5. That cost benefits and rates of returns were calculated and analyzed based on limited factors involved specifically on the actual net earnings (less taxes and production costs only) from the revenue on per round of excess ammunition sold commercially and that all excess ammo will garner 100% annual sales. Other factors such as amortization and depreciation of assets involved, government savings from factory price sales to primary end-users, other taxes were not included in the calculations.

### C. Salient Points of the Project:

1. The cost-benefit analysis with return on investment calculation is conducted to estimate and compare the benefits and costs of investing in a dedicated ammo manufacturing line capability, to include the expected returns on per round of small arms ammo (5.56mm, 7.62mm, 9mm, and Cal .45) manufactured by GA upon implementation of such capability.

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2. As of 2012, the GA has manufactured 19M rounds or 67% supportability for AFP ammo requirements only. This percentage of requirements is based on a 2011 study made that indicates a 98% supportability for the AFP only by 2014 with the current manufacturing line at the GA. However, upon acquisition and employment of the dedicated manufacturing lines, the GA would be able to manufacture at least 110M rounds per year or 265% supportability for all primary end-users annually, with 165% of the total output generated (excess output) to be made available for the external markets (local and foreign / government and non-government distributors and consumers).
3. At this point, it should be noted that the primary end-users are the AFP-PNP-LEAs per EO 303. Hence, the GA is mandated to provide these stakeholders with all their required small arms ammo.
4. The investment, therefore, sees the full accomplishment of GA mission, with an increased production of high quality-factory cost products that could provide additional revenue for the government. This investment would also provide opportunities for international recognition of Philippine defense products as well as an expanded Philippine defense industry (external market sales) and expanded GA capability (opportunity to venture deeper into small arms repair and manufacture and other projects).
5. With the capability to manufacture at least 110M rounds per year upon project implementation and emplacement, a **return on investment gain on the sixth year with a yearend earning of at least PhP294.182M can be achieved.** Notwithstanding, distribution of ammo output among the four (4) calibers manufactured may vary depending on the demand and the costing of each caliber. As such, GA maintains the option to significantly increase the pricing and the manufacture of excess ammo caliber currently on high demand to significantly increase revenue and earnings.
6. However, the above estimated ROI and earnings can only be achieved upon 100% sales to the external markets. In the event of a 50% sale, the ROI would be achieved by the 11<sup>th</sup> year while a 75% sale would mean an ROI by the 7<sup>th</sup> year.
7. The rate of return and profitability of the project appears to be very favorable. In addition, as investment is returned and revenue cash flow is sustained, Philippine government defense industry is expanded by exploring other defense industry business ventures that would further add to the growth of Philippine defense industry and recognition of Philippine defense products. Other benefits and prospects that would accompany investment return and its subsequent investment profitability are also expected.

#### **D. Observations and Analysis:**

1. The following are the expected benefits and prospects from the investment return and their corresponding investment profitability evaluation:

##### **1.1 Sale of excess products to external markets -**

Excess output can be sold at relatively raised cost to

generate additional revenue for the government.

- 1.2 **Savings generated from ammo procurement of primary end-users** - Government savings can be optimized and sustained since all primary end-users, being government bureaus, are benefited from factory cost sales.
- 1.3 **Continuous exploration, identification, and exploitation of local and foreign demand for ammo to assure a 100% annual products sales** - GA products are assured of high quality international standards and significantly prolonged shelf life of 30 years, a feature that is lacking in most if not all ammo sold in the international market. GA ammo are vacuum-sealed and are packed with dehumidifier, to ensure longer storage life.
- 1.4 **Improved favorable reputation for GA products that is ideal for marketing** - In the long term, GA products would be reputed to have high standard quality and consistent availability, hence external marketing (based on lower cost, higher material quality, longer and more robust shelf life, efficient traceability from laser marking, and reliability and accuracy of military spec ammo) would be easily ensured to support sustained and maximized product sales.
- 1.5 **Increased profitability following a maximum or high sales percentage from excess supply of ammo** - Excess supply of products should not be limited to the excess of annual primary end-user requirements as officially listed in the 2011 survey. It is highly probable that the total expenditure of primary end-users would not always be equal to their total annual requirements every year. Yearly requirements based on previous expenditures might vary allowing more surplus ammo supply.
- 1.6 **Additional production systems options for much increased production output** - The estimates made in this report are based on a 2-shift working day. In the event that demand exceeds the supply from the GA, additional work shift and weekend/holiday work days can be implemented as well as manufacturing lines reconfiguration depending on any particular caliber on high demand.

2. Production (excess) output for sale to local and foreign markets to gain revenue for the government shall place the GA in a status where it ceases to be a non-profit organization. A manufacturing agency that sells its products to external non-government markets to earn revenue for the government constitutes conditions that merit a profit organization.
3. During the current heightened thrusts towards AFP and GA modernization and the foreseen uplift of GA's role in national defense and the PDI, it is important to recognize the role of the GA as a defense critical infrastructure (infrastructure and assets essential to project, support, and sustain military forces and operations). It can be expected in this regard that the GA, while functioning its role as the premier defense industry agency of the country, would not only be a national-strategic critical capability target, but an industrial sabotage target as well.

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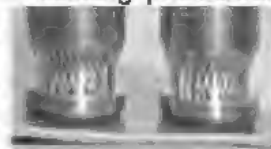


## LASER MARKING OF AMMUNITION

The present system of marking GA's ammunition involves stamping the code of the manufacturer and year of manufacture on the bottom of the brass cartridge case, and ammo data card is placed in each crate of ammunition during packing. Although such practice will determine the manufacturer through the head stamp and the year of manufacture, it will not guarantee traceability of ammunition belonging to one lot of hundred thousand rounds, especially if during storage in the military supply depots or used in the battlefield, the ammunition are separated from the packaging.

In its continuing concern for the proper traceability and accounting of ammunition it produces and at the same time be abreast with technology, the GA is embarking on an initial equipment acquisition project for a LASER MARKING & PACKAGING MACHINE for 5.56mm ammunition, with conversion (or usable also) to 7.62mm. Post-qualification of the Lowest Calculated Bidder to validate its legal existence as well as its financial and technical capability, has been conducted last April 2014 and awaiting the Department's approval and issuance of Notice of Award.

The existing design of equipment as per market research has a wide variety of functions and specifications that match the need of different ammunition manufacturers. The laser marking technology enables marking of ammunition after assembly that cannot be done in other conventional techniques such as stamping and mechanical engraving. Laser marking allows marking of all kinds of surfaces through burning by oxidation, and has the advantage of requiring no physical contact with the surface to be marked. It also enables marking of areas inaccessible to other marking procedures. Computer-operated lasers mark individual rounds of ammunition in the cartridge's groove prior to packaging. The initial requirement is for a production rate of 120 rounds per minute for small caliber.



Its material inputs are the finished cartridges and 30-round carton boxes (for 5.56mm ammunition) or 20-round carton boxes (for 7.62mm ammunition). Besides the laser marking of individual ammunition, the machine will also imprint the necessary standard markings on the carton box such as the caliber type, lot number, etc., and with added feature of including a data matrix containing pertinent ammunition data (similar to bar codes) stored in a data base in the main computer.

Acquisition of the new machine is aimed towards attaining an efficient and effective system of ammunition traceability and preventing possible attempts of misappropriation. This will provide adequate marking of ammunition with information that will aid authorities in tracing its origin, transfer, receipt, utilization and/or disposal. Acquisition of the machine will provide traceability path of GA-manufactured ammunition. Besides, it is expected to improve the AFP's system of distribution, control and accounting of SAA from the GA. Moreover, laser-marked ammunition will be easier to identify, and therefore, it will facilitate recall of specific lot(s) that may be found to have deteriorated, which is very difficult to implement under the present system.



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### E. Recommendations:

1. Continuous study should be made by economics defense industry experts to determine the demand trends and shifts for commercial and military spec ammunition both locally and internationally. Possible joint ventures with suppliers to market GA products can also be considered along this line.

2. Studies should also be made regarding the implications resulting from the change of status of the GA from a non-profit to a profit organization. Revenue generation by the GA for the government might entail the need for the GA to be a Government Owned and Controlled Corporation (GOCC). In this regard, such a status might, in the long run, benefit not only the GA but the entire Philippine defense industry as well.

3. Serious consideration of legitimizing GA R & D capabilities and its small arms repair and manufacture capabilities either solely or in partnership with local or foreign

proponents in view of the need to upgrade AFP infantry weapons systems and subsequently equip AFP Reservists.

4. The highly probable status of the GA as a defense critical infrastructure must be given particular attention. Appropriate critical infrastructure protection must therefore be considered and/or adopted. For this measure, actions are taken to prevent, remediate, or mitigate the risks resulting from vulnerabilities of critical infrastructure assets. Depending on the type of clear and present risk at hand, these actions may include but are not limited to: changes in security tactics, techniques, or procedures; adding redundancy (possible future manufacturing lines in other defense real estates); selection of another asset; defined isolation or hardening; heightened guarding; continuous industry environment review/analysis; etc.

5. Special consideration should also be provided with regard to the disposition of excess ammunition manufactured. As such, it would do well to consider that excess ammo produced / unsold excess ammo may be channeled to AFP-PNP strategic reserves or as training ammo.



# SMALL ARMS REPAIR AND UPGRADE UNIT

*Living up to the challenges of the times...*

*"There is no one road to success. There are as many as there are those willing to build them."*

*- John C. Maxwell*

This write-up puts into words and images the fascinating, challenging and fulfilling journey that Small Arms Repair and Upgrade Unit (SARUU) have had in a relatively short span of time, i.e. more than a year after its creation. Fascinating because of all the people involved in the successful accomplishments of SARUU. For the most part, they are ordinary people, faced with extraordinary circumstances in life, which they face with resilience and surmount with faith and hope. Challenging because they themselves did not think they can surmount the expectations they were given. Fulfilling because SARUU is in a position to be of help, to make a difference, no matter how small, to the Government Arsenal (GA), to the Armed Forces of the Philippines (AFP) and to our country the PHILIPPINES.

Anchored on the ideals of the vision of the Government Arsenal (GA); *To achieve self-sufficiency in ammunition and weaponry for use of the AFP, PNP and other Government Agencies*; this Bureau began transformation by the realization of Section 2, Letter A of Republic Act No. 1884 "An Act to Establish a Government Arsenal, Provide for its Operation and for Other Purposes" which was approved on June 22, 1957:

Section 2. **Designation of Agency:** Creation of the Office of the Undersecretary of Defense for Munitions.

In Addition to the functions and duties vested in him by existing laws, the Secretary of National Defense will exercise supervision and control over the Government Arsenal and is hereby authorized to establish, operate and maintain such as an Arsenal, as well as accessory plants for the continued and efficient operation of this arsenal for the design, research, development of production techniques, manufacture and repair of small arms, mortars and other weapons, ammunition for these weapons, and other munitions.

It was on this premise that on the 2<sup>nd</sup> quarter of CY 2011, the GA under the dynamic directorship of MGen Jonathan C Martir PN M (Ret), started assembly of the following weapons which was headed by Engr. Dennis S Chua and assisted by Maj. Noel M Tiu PN (M): three (3) units of 5.56mm M4 Carbine 14.5" barrel length which were given namely to the Secretary of National Defense, Voltaire T Gazmin, Undersecretary Fernando I Manalo and AFP Chief of Staff General Jessie D Delloso on the 44<sup>th</sup> Founding Anniversary of GA on October 2011; one (1) unit M4 14.5" barrel length which was provided as sample model of S & T DAEWOO for eventual production in GA and; one (1) unit 5.56mm Special Purpose Rifle (SPR) 18" barrel length for GA's demo purposes.

On December 15, 2011, three thousand two hundred ninety – eight (3, 298) units M16A1 rifles of the eight thousand (8, 000) units stored at LOGCOM Warehouse GHQ Supply Unit were turned – in



to this Bureau.

Likewise, GA has been tasked by the Secretary of National Defense, Voltaire T Gazmin, to undertake the repair / refurbishment and upgrade of aforesaid firearms. Therefore, on January 24, 2012, this Bureau has established a new unit named **Small Arms Repair and Upgrade Unit (SARUU)** to handle the repair and upgrade. This unit was headed by Engr. Dennis S Chua and assisted by Maj. Noel M Tiu PN (M) and Engr. Kathleen Donnah P Reotutar.

SARUU started with thirteen (13) personnel on the line, commenced repair / refurbishment and upgrade of the first two hundred (200) units M16A1 (176 units M16A1 Rifle and 24 units of M16A1 Dissipator 16" barrel



length) on November 15, 2012, and subsequently turned – over to the AFP last December 20, 2012 at the Government Head Quarters, Camp Aguinaldo, DND.



On May 16, 2013, SARUU with 19 personnel, turned-over the second set of newly refurbished Rifles of five hundred fifteen (515) units comprising of 490 units M16A1 Rifle and 25 units of M16A1 Dissipator 16" barrel after Functional tests and zeroing done by J4 and AFPMCC representatives here at the GA's Firing Range.



This was followed by the bulk turned-over to AFP of the third set of one thousand twenty five (1,025) units newly refurbished Rifles comprising of 1,000 units M16A1 Rifle and 25 units of M16A1 Dissipator 16" barrel on February 28, 2014 witnessed by SAO-DND Ms. Nenita Repiso



While relatively young, SARUU has already had a most remarkable journey, one that has transformed the way to help the AFP. As SARUU

*(Continued on page 10)*



(Continued from page 9)

continually evolve to rise to the challenges of advanced weapons technology, so does SARUU constantly improve on how to best address the needs of the AFP.

Thus, on March 2013, SARUU upgraded the Elisco-made M16A1s to basic M4 configuration with 1-7 inch twist barrel and utilizing the GA fabricated muzzle brake, tactical latch, enhanced trigger guard and cycle reducer. A total of Twenty Five (25) units Rifles (10 units M4 Upgraded and 15 units M16A1 Dissipator) were turned-over to GA Security Force and Naval Special Operations Group (NAVSOG).

Another milestone of SARUU was the development of new weapon system, the 10" Musang (7.62 x 37mm) Personal Defense Weapon (PDW) based on M4/M16 platform and cycles full auto with 7.62 x 37mm Musang subsonic and supersonic rounds. Its design objectives include increased lethality over 9mm and 5.56mm, improved controllability, reduced size and weight and a maximum effective range of 300 meters.



On December 12, 2013, AFP DISG turned-in thirty-two (32) units unserviceable Cal.45 for repair and refurbish which



were turned-over last January 30, 2014.

One of the key areas where SARUU sought to define the term **SUCCESS** was **EDUCATION** through trainings/seminars. While the repair and upgrade of unserviceable firearms may have been sufficient as acts of government philanthropy for a while, it soon became clear that these efforts were not making the impact that long-term, trainings/seminars could. These training/seminars could somehow be deeply embedded on the participants.

November 08 - 11, 2011:  
Rifle Maintenance Course to  
Philippine Coast Guard

July 4, 2013:  
Basic Weapon Training to  
Philippine Coast Guard



August 13 - 15, 2013:  
Weapons Inspection Seminar  
to GA Security Force

January 29 - April 8, 2014:  
Special Armaments  
Technician Training to  
Philippine Marine Corps.



These successes of SARUU is not only a harvest of accomplishments, but an embodiment of how genuine teamwork makes a difference. And more than making for compelling narratives, the successes behind these figures, as vividly captured in this write-up, also represent GA's **"An Accurate Shot to the Future"**.

(By: Engr Kath Rectutar)

(Continued from page 5)

arms repair and upgrade.

**4.2 Utilization of 4140 Steel Raw Materials** - This project aims to make use of large diameter steel available in stock, for fabrication of weapon parts.

### C. The "Tri-Bond" Role in National Defense

A closer look into GA's recent, current and future programs and projects shows its intensive R & D activities in order to generate such technology and innovation initiatives in AFP-DND defense materiel development and manufacture efforts. In effect, the GA's mandate as reiterated in AFP Modernization Act IRR explicitly stated that "the GA shall be fully utilized in the conduct of defense materiel related R & D activities in consonance with the objectives of the SRDP Program of the government." Hence, the GA may arguably be considered as essentially a technology-intensive bureau whose core competence is the design and manufacture of munitions.

Notably, it becomes apparent that the current level of technology and innovation initiatives of GA are borne out of renewed research and development foresight and thrusts; increased pool of technical personnel; upgraded machines and equipment; and improved laboratories and testing facilities. As a result, the interplay of these T & I components proves how much the GA has gone in the field of R & D and T & I in support of SRDP and the PDI.

In due course, it can be expected that the Tri-Bond relationship between the GA, SRDP Program and the PDI would subsequently put their respective roles in national defense into proper perspective. While the GA steadily provides the capability for the DND to fully satisfy the defense requirements of the country's security forces, the GA and the SRDP program complement each other to achieve the said desired capability to a point where the country will be entirely independent from other allies, at least or initially only, for its small arms munitions systems requirements. Finally, the complementing interaction of the GA and the SRDP program would definitely boost the PDI where its eventual stability and productivity would return for the GA and the SRDP program the much needed sustaining support to expand even further. It is envisioned that this desired symbiotic relationship among

(Continued on page 11)



(Continued from page 10)

the components of the defense Tri-Bond would eventually put the country within the international defense industry map.

At this point, it is interesting to note how former GA Director, RAdm Eriberto C Varona AFP (Ret) cited several defense projects in his 2003 article, "SRDP: The Role of the GA." He noted how the potential of the GA as an active participant in the implementation of SRDP can be properly harnessed to uplift the PDI. In addition, the incumbent Director, MGen Jonathan C Martir AFP (Ret) stressed in his 2013 article entitled "Why Do We Need the GA?" that the GA is a strategic defense resource of the DND and it is imperative that the national leadership support the enhancement of its production capability and capacity to a level where it could fully provide the country's defense requirements especially within a constantly evolving security environment. Clearly, these two (2) articles emphasize the need to steadily sustain and continuously enhance the capability of the GA in support of the SRDP program and eventually towards the strengthening of the PDI.

In retrospect, it would be tempting for an independent state to assume a posture of dependence upon an enormously strong ally. However, an implemented SRDP program that was neglected over the years due to a diminutive effort for its support and sustainment would simply be unacceptable. The GA is mandated to prosecute national defense projects for the acquisition of military material and to design and develop small arms and other weapons, their ammunition and other munitions in support of national defense. Along this line the GA has always been committed to produce high quality (not quantity) but low costing munitions for use of men and women who dedicate their lives for the country. It is therefore deemed only fair to maintain and improve such capability not only towards self-sufficiency in munitions requirements but towards the overall need to stand strong alone in a volatile, uncertain, complex, and ambiguous security environment.

*"The gods help them that help themselves." – Aesop*

**Roger S Gamban**  
Chief, Strategic Management Office

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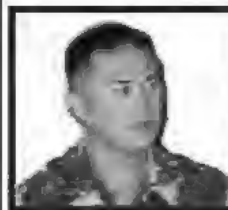
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## FEATURE PERSONNEL

### SGT WILLARD B CARRERA



SGT WILLARD B CARRERA 837699 (MI) PA was assigned at the GA since 01 February 2013 and designated as Assistant Safety and Security Non-Commissioned Officer, Small Arms Repair and Upgrade Unit effective April 10, 2014.

He was formerly assigned at the Marksmanship Training Unit, TRADOC, PA from 15 November 2003 to 31 January 2013.

Sgt Carrera may seem to be just an ordinary man in uniform and one among those assigned in GA as reinforcement on safety and security inside the camp. But what keeps him apart from being ordinary is his having qualified to be a member of the Philippine Team to represent our country in IPSC Handgun World Shoot XVII out of 200 shooters who tried to qualify in the Qualifiers Match. Said event will be held at the Universal Shooting Academy Range in Frostproof, Florida, USA on October 6-19, 2014, and Sgt Carrera's expenses for said competition will be shouldered by the Philippine Practical Shooting Association.

This sharpshooter was born on 24<sup>th</sup> of August 1984 at Bgy. Bagacay, Hinabangan, Samar, had one year college study on Information Technology, and married to Jonalyn A. Lopez where he is blessed with a one-year old daughter. He has his present address at Univille Subdivision, Bangad, Cabanatuan City, Nueva Ecija.

Having earned his rigid training in TRADOC, he was a former member of the Pistol Army Shooting Team competing in Asean Armies Rifle Meet (AARM).

For his service and for winning in various shooting competitions, Sgt Carrera has earned numerous Military Merit Medals, Military Commendation Medals, Letters of Commendation, Certificates of Appreciation and Recognition, and Expert Marksmanship Badge. He had also received a Presidential Citation and Philippine Republic Pres Unit Citation Badge. He received a Military Shooting Award for being Champion in Australia Skill At Arms Meet (Combat Pistol Course) in 2012; and more recently, he received a Civilian Shooting Award, i.e. PPSA National Champion, Production Division, in 2013.

They say, there's no limit to one's dream, and if we dream, better dream big. Sgt Carrera's wish is to bring home the title when they compete in the World Shoot XVII.

For now, his assignment in GA will provide him opportunities for continuous skills training to further hone his shooting proficiency, and the entire GA workforce wishes him well, along with the Team Philippines in the forthcoming World Shoot XVII.

Carry on Sgt Carrera... and to the Team Philippines,

**MABUHAY!!!**





Mr Jean Roy Ryu, CEO of POONGSAN Corp. - Jan 21, 2014



Maj Michael Charles Van Hoven of JUSMAG - March 6, 2014



Visitors from RHEIN METALL DENEL MUNITION - March 31, 2014



Key officials of POONGSAN Corporation - April 03, 2014



Counsellor Jan Vytopil of Czech Republic Embassy - April 11, 2014



DND Internal Control Team - April 24, 2014



Dir Johan Jagger of BOWAS AG - May 12, 2014



Installation of EPVAT - May 13, 2014

**Government Arsenal/DND-Camp General Antonio Luna, Lamao, Limay, Bataan**  
**Website: [www.arsenal.mil.ph](http://www.arsenal.mil.ph); email: [arsenaldnd@yahoo.com](mailto:arsenaldnd@yahoo.com); Tel: (047) 244-5626 / (02) 421-1554**